Insect Populations in Grain Residues from Kansas Elevators

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Introduction

Most U.S. wheat is stored in large commercial elevators

Elevator silos can quickly become infested with stored-grain insects

Sources of infestation may include old grain, trucks and railcars, and spilled grain in outside areas

Little is known about the sources of infestations in commercial elevators

Grain residues in on-farm storages are known sources of infestations, so elevator silos may also have resident populations

Objectives

Determine species composition of insects in grain residues in commercial elevators

Quantify distributional and seasonal density patterns of these populations

Assess time required to inspect and remove residues in specific areas

Materials and Methods

Nine elevators in Kansas were visited repeatedly for 2 years, frequency depended on amount of grain stored

Residues obtained from: elevator boot, tunnel dump pit, rail line, ground or deck level of the headhouse

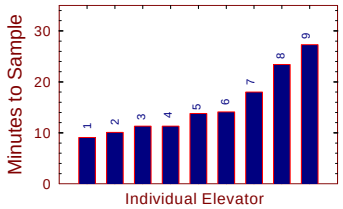
Methods Continued

Grain residue identified and estimated as: < 1.5 kg, 1.5-2.7 kg, 27-135 kg, or > 135 kg

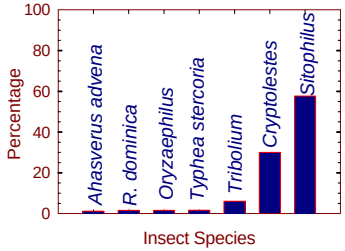
Insects identified to either species or genera

Results analyzed using the Statistical Analysis System (SAS)

Results



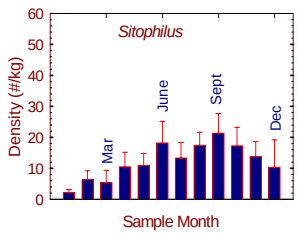
Sample time was 9 to 31 minutes, proportional to the size of the elevator

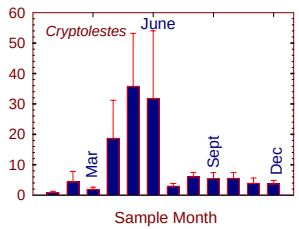


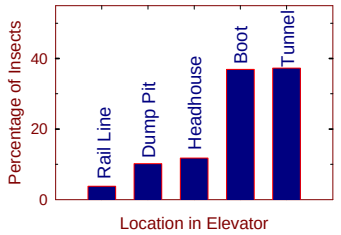
Cryptolestes and *Sitophilus* made up ca. 80% of insects collected

Sitophilus density peaked in the summer months

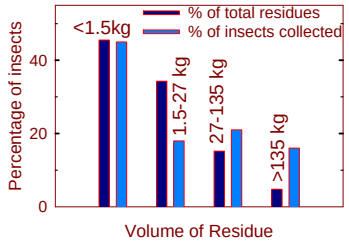
Cryptolestes density peaked in the spring months, then declined







Most insects found in samples from elevator boot pit and tunnel

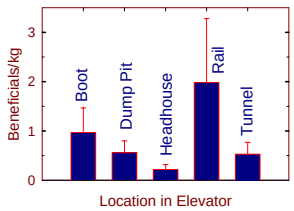


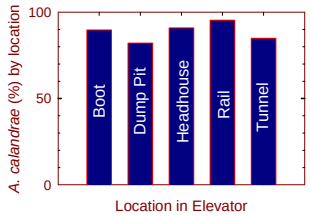
Samples of residue < 1.5 kg contained more insects than other samples

Beneficial Insects

Samples from boot pit and rail line contained most of the beneficials

Anisopteromalus calandrae was the dominant species





Summary

Pest insects found throughout the year, *Sitophilus* and *Cryptolestes* were dominant

Cooler temperatures and accumulated grain in boot and tunnel favor *Sitophlus*

Grain residues are likely sources for dispersal and infestation